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Marshall to Host Small-Business Industry Day Events June 9-10

On June 9-10, NASA's Marshall Space Flight Center will host a pair of industry events for small-business entrepreneurs seeking to network with NASA prime contractors and agency spokespersons about a variety of NASA business endeavors.

Marshall will host an [Exploration Systems Development](#) update June 9 from 12:30-4:30 p.m. The event will be held at the [Huntsville Museum of Art](#) at 300 Church St. in downtown

Huntsville. Senior managers from Exploration Systems Development organizations, including the [Space Launch System](#) -- NASA's next flagship, set to carry new exploration missions into the solar system -- will provide an update on their latest accomplishments and future plans. Interested parties [may register online](#).

The following day, June 10, the NASA/MSFC [HUBZone Industry](#)

*See **Industry Day** on [page 2](#)*

NASA Names Winners in 2013-14 Student Launch Challenge; Vanderbilt Repeats, Takes Top Prize

By Bill Hubscher

For the second year in a row, the Aerospace Club from Vanderbilt University in Nashville, Tennessee, earned first prize in NASA's Student Launch challenge. The educational project tasks student teams to design, build and test-fly sophisticated, reusable rockets capable of carrying working science payloads to a predicted altitude and



The rocket team from Vanderbilt University in Nashville, Tennessee, recovers its vehicle after a successful launch at the Bonneville Salt Flats in Utah on May 17. Vanderbilt was declared the winner of the event, taking home multiple awards. (NASA/MSFC)

*See **Student Launch** on [page 3](#)*

Marshall Exchange to Sponsor June 5 Employee Appreciation Cajun Fest

The Marshall Exchange is sponsoring an Employee Appreciation Cajun Fest on June 5 from 2:30-6 p.m. in Building 4316 in the Marshall Picnic Area.

All Marshall Center team members are invited to come enjoy a sampling of Cajun cuisine including gumbo, red beans and rice, catfish, shrimp, crawfish etouffe and more. Locally crafted beer from Straight

to Ale and The Brew Stooges will also be available.

A live band will provide entertainment and team members may also participate in volleyball and corn hole games.

For more information, visit [here](#).

New Meteor Shower Detected by Meteor Radar

So, what happened with the May Camelopardalids? It was a new shower, so no one knew what to expect, but anticipated meteor rates were on the order of 0-200 meteors per hour.

Visual observers reported rates near 15 meteors per hour. Very few May Camelopardalid meteors were seen with the naked eye, but many were observed with meteor radar. As it turns out, the meteoroid stream was rich in small meteoroids that produced faint meteors, making them hard to see but easy to detect with radar.

If you missed the May Camelopardalids, you can see our collection of Camelopardalids images on the NASA Flickr gallery [here](#).



A confirmed May Camelopardalids meteor as seen over Pennsylvania at 10:22 p.m. EDT May 23. (NASA/MSFC)

Industry Day *Continued from [page 1](#)*

Day will be held at the Huntsville Museum of Art from 7 a.m. to 1 p.m. It is designed to provide federal contracting assistance to small businesses operating in historically underserved business zones in an effort to increase employment, investment and economic development in those areas. Although the emphasis is on HUBZone concerns, all small businesses are invited to attend.

Event speakers will include Glenn Delgado, associate administrator of NASA's [Office of Small Business Program](#); Marshall Center Director Patrick Scheuermann; Huntsville Mayor Tommy Battle;

Madison Mayor Troy Trulock; Marshall Office of Procurement Director Kim Whitson; and Marshall Small Business Specialist David Brock.

Small business representatives can participate in workshops and network with NASA small business personnel and large and small business prime contractors. [Registration for this event](#) is limited to three attendees per company, and includes a \$25 registration fee for non-government employees.

For more information, contact David Brock at david.e.brock@nasa.gov or 256-544-0267.

Student Launch *Continued from page 1*

return them safely to Earth.

This year's event, designed to inspire the next generation of engineers, scientists and explorers, culminated with a "launchfest" May 17 at the Bonneville Salt Flats in Utah. The Academic Affairs Office at the Marshall Space Flight Center organized the event, with assistance from the event's corporate sponsor, ATK Aerospace Group of Promontory, Utah. Each team was given the opportunity to launch its rocket with a custom-built recovery system and three payloads on the salt flats. To determine a winner, NASA judges evaluated each team's entry based on a series of technical design reviews, the results from each rocket's flight, including altitude, educational engagement activities in their home community, a team-built website and a written report from the students.

Vanderbilt beat out 20 other colleges and universities to win the \$5,000 top prize, provided by ATK. Mississippi State University in Starkville and the University of Louisville in Louisville, Kentucky, won second and third place, respectively. The University of Puerto Rico in Mayaguez won this year's Rookie Award.

"This challenge helps students stretch their intellectual skills," said Tammy Rowan, manager of Marshall's Academic Affairs Office. "The project is a valuable tool for students and faculty. The students use knowledge gained in a classroom setting to create a complex launch vehicle, honing skills that could lead them to a future in the aerospace industry. Their enthusiasm when their rockets fly is inspirational to those who already work in the many different aspects of space exploration."

NASA's Human Exploration and Operations Mission Directorate at NASA Headquarters sponsors the Student Launch challenge. ATK provides corporate support, and the National Association of Rocketry assists NASA engineers in providing technical review and launch services.

Hundreds of flight enthusiasts flocked to the launch site to cheer on the student rocketeers. Thousands more watched live commentary on the NASA-TV broadcast channel and the live stream on the agency's UStream service. Archived launch-day



The rocketry team representing Vanderbilt University is interviewed on NASA-TV by Charlie Precourt, veteran astronaut and vice president of the Space Launch Division at ATK Aerospace in Promontory, Utah. The team had just recovered its launch vehicle during the NASA Student Launch rocketry challenge "Launchfest" event at the Bonneville Salt Flats. (NASA/MSFC)

coverage is available at:

<http://www.ustream.tv/recorded/47671874>

<http://www.ustream.tv/recorded/47677858>

For the complete list of awards presented at the post-launch banquet on May 17 in Utah, visit [the Marshall Star issue published on May 21](#).

For complete lists of participating teams, visit:

<http://www.nasa.gov/education/studentlaunch>

Visit NASA Student Launch Projects on [Facebook](#) and [Twitter](#).

Hubscher, an ASRC Federal Analytical Services employee, supports the Office of Strategic Analysis & Communications.

Chandra Helps Explain ‘Red and Dead Galaxies’

From Web release

NASA’s Chandra X-ray Observatory has shed new light on the mystery of why giant elliptical galaxies have few, if any, young stars. This new evidence highlights the important role that supermassive black holes play in the evolution of their host galaxies.

Because star-forming activity in many giant elliptical galaxies has slowed to very low levels, these galaxies mostly house long-lived stars with low masses and red optical colors. Astronomers have therefore called these galaxies “red and dead.”

Previously, it was thought that these red and dead galaxies did not contain large amounts of cold gas — the fuel for star formation — helping to explain the lack of young stars. However, astronomers have used the European Space Agency’s Herschel Space Observatory to find surprisingly large amounts of cold gas in some giant elliptical galaxies. In a sample of eight galaxies, six contain large reservoirs of cold gas. This is the first time astronomers have seen large quantities of cold gas in giant elliptical galaxies that are not located at the center of a massive galaxy cluster.

With large amounts of cold gas, astronomers would expect many stars to be forming in these galaxies, contrary to what is observed. To try to understand this inconsistency, astronomers studied the galaxies at other wavelengths, including X-rays and radio waves. The Chandra observations map the temperature and density of hot gas in these galaxies. For the six galaxies containing abundant cold gas, including NGC 4636 and NGC 5044 shown here, the X-ray data provide evidence that the hot gas is cooling, providing a source for the cold gas observed with Herschel. However, the cooling process stops before the cold gas condenses to form stars. What prevents the stars from forming?

A strong clue comes from the Chandra images. The hot gas in the center of the six galaxies containing cold gas appears to be much more disturbed than in the cold-gas-free systems. This is a sign that material has been ejected from regions close to the central black hole. These outbursts are possibly driven, in part, by clumpy cold gas that has been pulled into the black hole. The outbursts dump most of their energy into the center of the galaxy, where the cold gas is located, preventing the cold gas from cooling sufficiently to form stars.

The other galaxies in the sample, NGC 1399 and NGC



(X-ray: NASA/CXC/Stanford Univ/N. Werner et al; Optical: DSS)

4472, are also forming few, if any, stars, but they have a very different appearance. No cold gas was detected in these galaxies, and the hot gas in their central regions is much smoother. Additionally, they have powerful jets of highly energetic particles, as shown in radio images from the National Science Foundation’s Karl G. Jansky Very Large Array. These jets are likely driven by hot gas falling toward the central supermassive black holes. By pushing against the hot gas, the jets create enormous cavities that are observed in the Chandra images, and they may heat the hot, X-ray-emitting gas, preventing it from cooling and forming cold gas and stars. The centers of NGC 1399 and NGC 4472 look smoother in X-rays than the other galaxies, likely because their more powerful jets produce cavities farther away from the center, where the X-ray emission is fainter, leaving their bright cores undisturbed.

A paper describing these results, published in the Feb. 25 issue of the *Monthly Notices of the Royal Astronomical Society*, is available [online](#). The first author is Norbert Werner from Stanford University in California.

NASA’s Marshall Space Flight Center manages the Chandra program for NASA’s Science Mission Directorate. The Smithsonian Astrophysical Observatory in Cambridge, Massachusetts, controls Chandra’s science and flight operations.

Citizen Inventor Teams To Compete For \$1.5 Million At NASA's 2014 Sample Return Robot Challenge

By Janet Sudnik

Eighteen teams of citizen inventors from across the globe will compete in the 2014 NASA Centennial Challenges Sample Return Robot Challenge June 11-13 on the campus of Worcester Polytechnic Institute (WPI) in Worcester, Massachusetts. Prize money of nearly \$1.5 million is on the line in this third running of the challenge.

The teams must demonstrate a robot that can locate and collect geologic samples from a wide and varied landscape without human control. The objective is to encourage innovations in automatic navigation and robotic manipulator technologies. Innovations stemming from this challenge may improve NASA's capability to explore a variety of destinations in space, as well as enhance the nation's robotic technology for use in industries and applications on Earth.

At the 2013 competition, NASA awarded \$5,000 to Team Survey of Los Angeles for completing Level 1 of the challenge. NASA expects the 2014 event will advance the progress of the competition even further.

"We are excited to see what these 18 teams can achieve this year, building on the lessons learned during the first two years of the challenge," said Sam Ortega, program manager of Centennial



Team Survey places their robot on the starting platform during the NASA 2013 Sample Return Robot Challenge at Worcester Polytechnic Institute in Worcester, Massachusetts. Survey was the only team to complete Level 1 last year for \$5,000. They are returning to compete for the remaining prize money (NASA/Bill Ingalls)

Challenges, which is managed for the agency by NASA's Marshall Space Flight Center. "We hope to see broad success with more teams completing Level 1, and that some of those teams are able to tackle the more difficult objectives in Level 2 necessary to take home the big prize money."

Each team must complete two levels of competition. For a robot to successfully complete Level 1,

See **Robot Challenge** on [page 6](#)

Marshall Center 3-D Printing Collaboration Featured on NASA-TV

The recent collaboration between the Marshall Space Flight Center and Made in Space of Mountain View, California, was featured on the May 22 episode of Space Station Live on NASA-TV. The program is a daily update of the activities and experiments onboard the International Space Station.

Made in Space is building an additive manufacturing machine to be used in orbit on the space station. Working with Marshall Center personnel, Made in Space scientists put their 3-D

printer through a variety of tests to ensure the device is ready for flight. The next step will be to test the printer on the space station to eventually establish a working machine shop in space.

The [video posted online](#) includes interviews with NASA and Made in Space team members presenting details on the process and shows the machine at work in Marshall laboratories. You can view this segment and previous videos from Space Station Live on the [ReelNASA YouTube channel](#).

Retired Marshall Center Engineer and Manager Otto Goetz Dies

Marshall retiree Otto Goetz died May 24 at his home in Huntsville.

Goetz who was born in Rastatt, Germany, in 1932, graduated from the Technical University of Karlsruhe, Germany, in 1957 with a degree in mechanical engineering. After working in Switzerland, he immigrated to the United States in 1961 to work at Redstone Arsenal.

Goetz joined the Marshall team in 1962, where he became a lead engineer for testing combustion devices and engine turbopumps for the Saturn/

Apollo launch vehicles. He was later assigned to the evaluation board for the space shuttle main engine.

He transferred from Marshall Center's Test Laboratory to the center's Propulsion Laboratory where he served as the lead engineer for combustion devices and turbomachinery for shuttle main engine. As a chief engineer and later as manager for the main engine, his work focused on continued improvements to the engine.

To learn more about Goetz's career, visit [here](#).

Robot Challenge *Continued from page 5*

one undamaged, pre-cached sample must be autonomously returned to the starting platform within the 30-minute time limit. Only teams that complete Level 1 will be given an opportunity to compete in Level 2.

To successfully complete Level 2, a robot must autonomously return at least two undamaged samples, including the pre-cached sample, to their starting platform within the two-hour time limit.

The challenge begins June 11, with awards to be presented June 14. The awards ceremony will take place during the TouchTomorrow technology festival on campus, showcasing the teams and robots as well as NASA and WPI exhibits in science, robotics and space technology.

Sudnik, an ASRC Federal Analytical Services employee, supports the Office of Strategic Analysis & Communications.

Obituaries

Mary Nell Estes Reagh, 88, of Huntsville, died May 22. She retired from the Marshall Center in 1987 as an administrative officer.

Joyce J. Allen, 75, of Huntsville, died May 22. She retired from the Marshall Center in 1997 as a staffing assistant. She is survived by her husband, Gene Allen.

Otto Karl Goetz, 81, of New Market, Alabama, died May 24. He retired from the Marshall Center in 1996 as a deputy manager for development. He is survived by his wife, Lone Goetz.

Peter Henry Broussard Jr., 87, of Baton Rouge, Louisiana, died May 26. He retired from the Marshall Center in 1989 as an aerospace engineer. He is survived by his wife, Ruth Tondre Broussard.